OLAP reports - interactive reports that are highly formatted, easily deployed, and straightforward to use - deliver value to the entire organization. These reports accelerate the "Eureka moment" by exposing "sweet spots" of information in a data set directly to decision makers, knowledge workers, and information consumers. "Sweet spots" are selective pieces or collections of information that provide decision makers with immediate critical insight into business drivers. These OLAP reports can be regular status reports, but are especially effective for key performance indicator (KPI) reporting, business performance measurement reporting, and scorecard reporting, all of which are becoming increasingly important to decision makers. A robust reporting environment is required in which to perform these tasks.

Products such as PowerPlay™ by Cognos Inc. enable organizations to create and deploy highly formatted, interactive OLAP reports. These reports let users easily measure, manage, and track improvements in business performance. They also allow easy distribution of this information across the enterprise. Decision makers throughout the organization now have the information they need to significantly improve business results.

Because of the complexity of corporate organizations, and their data, it is not unusual for a particular enterprise to deploy several different products to analyze their data. Often these products are from different vendors.

For companies that want to track performance and trends, or perform scorecard-style management reporting (viz.: short, concise, and consistent), there is an even more fundamental concern. It can be extremely difficult to understand "the big picture" when the only accessible reports focus on transaction-level detail, because data in databases is organized for efficient storage and administration, not for summary-level analysis or exploration. In addition, data storage does not correspond to how the business is organized, so data must usually be manipulated and reformatted before the user can extract useful information from it.

If, for example, managers want to explore company performance in terms of product sales, a report that details the performance of individual sale reps will not help them spot overall trends. By reviewing summary information first, such as total sales per office or region, decision makers can more easily gain a "big

picture" view of business performance. They can then drill down to lower-level details to uncover what is driving these trends. Thus OLAP technology has brought significant value to business decision making. OLAP systems store and access data as dimensions that represent business factors like time, products, geographical regions, and sales channels. This information is stored "multi-dimensionally" - like a cube that can be viewed, turned, and explored from any angle. The information is also presented in a business context, like 'number of customer complaints by product line in North America last quarter,' rather than a database context - so decision makers have immediate access to the information they need to make the best decisions for the business.

Until recently, organizations have found it difficult to meet some of these user requirements. However, with the advent of OLAP tools enterprise-wide deployment of OLAP reports is now a reality. Cubes can be customized to reflect the dimensions and calculations (also called measures) based on data stored in the original database most commonly used in a given organization. OLAP reports are generated from one or more of these data cubes. Because each cube contains a wide variety of dimensions and measures, a vast number of reports can be built from the information in the cubes. The cubes can be considered as master reports or a collection of components that can be assembled to create a specific report.

With OLAP reports, the user's first view of the data is a 'top-level' one that reveals patterns and trends at a glance. If users have identified issues in this summary-level information, OLAP reports enable them to fully explore and analyze the data set from several perspectives or angles, to varying levels of detail. The reports also enable users to 'slice and dice', drill down, drill up, and provide alternative graphical views of their data — something paper reports cannot offer. (The term 'slice and dice' generally implies a systematic reduction of a body of data into smaller parts or views that will yield more information. The term is also used to mean the presentation of information in a variety of different and useful ways.)

OLAP reports that take an analyze-then-query approach allow decision makers to access data the same way they identify and solve problems: by

reviewing totals or summary information first, then looking at the underlying details by drilling down to transaction-level details whenever necessary.

There are two major stages in implementing a reporting solution. The first step is to create OLAP cubes, the multidimensional structures that house summary-level details of the corporate data. Typically, these cubes are created by IT specialists and deployed to information analysts and report authors. The cubes are customized models of a business that reflect the unique characteristics of the company. The structure of a cube is defined in terms of dimensions and measures. Dimensions are hierarchical categories of information like time, products, and geography. For example, the product dimension hierarchy may be organized by product line, product group, and then by individual product. Measures are the (results of) calculations based on the original data that are used to track the business such as revenue, units sold, and cost of sales. In other words, measures are the numeric columns that present the count or summation of particular values that users would like to see in their reports.

OLAP cubes generally contain only the dimensions and measures relevant to a specific analysis. For example, sales analysis data and human resources data would be housed in separate cubes. This ensures that cubes remain manageable, not just in terms of their size but also in terms of the clarity of the information they contain. With appropriate tools, diverse but compatible cubes can be easily linked together so that users can move effortlessly from one cube to another, accessing information from all areas of the company.

Once OLAP cubes are created and deployed, report authors have everything they need to produce a wealth of OLAP reports. The process for authoring is extremely straightforward for all types of reports: status reports that reveal a snapshot of data; ad hoc reports that answer specific questions; and business performance management reports that track KPIs (Key Performance Indicators).

Although OLAP reports can be distributed on paper, it is well known that decision makers reap the most value when the reports are presented electronically. There are typically three ways to explore data in an OLAP report:

distributed over several sources means that it is also difficult to integrate it with such third-party applications. Additionally, each of these applications likely has different data format requirements.

Summary of the Invention

The present invention, particularly when incorporated in a drill-through modeling tool, solves or alleviates the above-mentioned problems, as well as providing several other advantages as will be made clear in the following description.

According to one aspect of the invention, there is presented a method of providing a drill-through service between two or more drill-through objects, the objects being drill-through sources and targets, the method comprising steps of defining one or more drill-through paths between drill-through objects, the drill-through path definitions being collected in a single structure; interfacing to the drill-through objects in a run-time environment using the collection of drill-though path definitions; and administering and maintaining the drill-through path definitions, independently of applications using them.

Such a DMT also provides graphical displays of drill-through paths for a DMT user or modeller. These displays show the parameters and dependencies of each drill-through path and allow users to obtain a quick overview of the drill-through network and further, they allow the tool user or modeller to confirm drill-through dependencies at a glance. Drill-through objects may thus be manipulated and maintained in a graphical manner.

A further understanding of other aspects, features and advantages of the present invention will be realized by reference to the following description, appended claims, and accompanying drawings.

Brief Description of the Drawings

Preferred embodiments of the present invention will be described with reference to the accompanying drawings, in which:

Figure 1 shows the computer and related systems and network within which the invention may be practiced;